

## REMARKS

Claims 1-13 are pending in this Application. Claim 13 has been added. Care has been exercised to avoid the introduction of new matter. Indeed, adequate descriptive support for the present Amendment should be apparent throughout the originally filed disclosure as, for example, page two of the written description of the specification, lines 10 through 12. Applicant submits that the present Amendment does not generate any new matter issue.

In the Office Action dated July 16, 2003, the Examiner imposed the following prior art rejections:

1. **Claims 1 and 4 were rejected under 35 U.S.C. §103 for obviousness predicated upon Narui et al. in view of Biricik et al.;**
2. **Claims 2 and 7 were rejected under 35 U.S.C. §103 for obviousness predicated upon Narui et al. in view of Biricik et al.;**
3. **Claims 3 and 8 were rejected under 35 U.S.C. §103 for obviousness predicated upon Narui et al. in view of Biricik et al. and Collins;**
4. **Claims 5, 9 and 18 were rejected under 35 U.S.C. §103 for obviousness predicated upon Narui et al. in view of Biricik et al. and Harafuji; and**
5. **Claims 6, 11 and 12 were rejected under 35 U.S.C. §103 for obviousness predicated upon Narui et al. in view of Biricik et al. and Kim et al.**

Each of the above prior art rejections is traversed. Specifically, each of the above prior art rejections is predicated upon an attempt to combine Narui et al. and Biricik et al. This attempted combination is factually and legally erroneous. Further, the fatal defects underlying such an

attempted combination are not cured by any of the secondary references to Collins, Harafuji or Kim et al.

### **Factual errors.**

The Examiner has not accurately stated the differences between the claimed invention and the method disclosed by Narui et al. As recited in claim 1, the claimed invention is directed to a method of fabricating a diffractive optical element, (DOE). The roll of a micro surface structure is to diffract an externally incident infrared-optical-laser beam yielding a phase difference, or a distance optical path difference of the laser beam. Accordingly, during etching, attention is placed not to the periodicity of the width in the traverse direction of the substrate, but to the smoothness of the etched surface. In accordance with conventional methodology for etching polycrystalline zinc selenide having a grain size of about 100 micrometers, an irregular etched surface results after etching to the required depth. This is because the etching speed is strongly affected by the crystal orientation in the conventional etching method. Consequently, diffraction utilizing the conventionally etched substrate cannot be realized.

However, the present invention addresses and solves that problem by achieving a smooth etched surface. This objective is achieved by employing a chlorine-based gas which does not include a hydrocarbon.

In contradistinction to the present invention, Narui et al. are addressed to a self-emitting optical device, such as a laser diode. However, the role of the grating disclosed by Narui et al. is **not** for diffraction, repeat **not** for diffraction. Rather, the disclosed grating is for resonance of a laser beam. Accordingly, the disclosed grating structure must have **periodical** distribution of a refraction index in a transverse direction. Periodicity is, indeed, important for Narui et al. and is

about 0.1-0.5 micrometers for a typical laser diode. Therefore, in carrying out the invention of Narui et al., careful attention must be paid **not** to the depth direction, repeat **not** to the depth direction. Rather, careful attention must be paid to the transverse direction of the substrate in creating the grating by etching. Indeed, as illustrated in Fig. 5 of Narui et al., a mask is used for precision work of the width in the transverse direction of the substrate. The material of the optical waveguide is less etchable than that of the grating. This type of optical waveguide is conventionally called a stopper layer from the standpoint of an etching method.

Accordingly, as a **factual matter**, the claimed invention **differs** from the methodology of Narui et al. in that it is directed to a method of making a **DOE**. On the other hand, Narui et al. disclose an etching method to form the grating layer employing a mask for precision work of the crystal layer in the **transverse direction**. However, in order to provide a **DOE**, a **smooth surface** is required which enables diffraction of an externally incident laser beam.

Moreover, as admitted by the Examiner, Narui et al. do **not** disclose the use of a **polycrystalline ZnSe substrate**. These fundamental differences between the claimed invention and Narui et al. are not cured by Biricik et al.

### **There is no Motivation**

In order to establish the requisite motivation, the Examiner must identify a **source** in the applied prior art for **each** claim limitation and a **source** in the applied prior art for the requisite **motivational** element. *Smiths Industries Medical System v. Vital Signs Inc.*, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999). As held by the Court of Appeals for the Federal Circuit, the Examiner is required to make a "thorough and searching" factual inquiry and, based upon that factual inquiry, explain **why** one having ordinary skill in the art would have been **realistically** impelled to

modify particular prior art, in this case the particular device disclosed by Narui et al., to arrive at the claimed invention. *In re Lee*, 237 F.3d 1338, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002). Such a factual inquiry requires clear and particular factual findings as to a **specific understanding** or **specific technological principle** which would have **realistically** impelled one having ordinary skill in the art to modify the particular device disclosed by Narui et al. to arrive at the claimed invention. *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 57 USPQ2d 1161 (Fed. Cir. 2000); *Ecocolchem Inc. v. Southern California Edison, Co.* 227 F.3d 1361, 56 USPQ2d 1065 (Fed. Cir. 2000); *In re Kotzab*, 217 F.3d 1365, 55 USPQ 1313 (Fed. Cir. 2000); *In re Dembicza*, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). Merely identifying wherein features of a claimed invention are perceived to reside in disparate references does not establish the requisite motivation. *In re Kotzab, supra*; *Grain Processing Corp. v. American-Maize Products Co.*, 840 F.2d 902, 5 USPQ2d 1788 (Fed. Cir. 1988). Rather, a **specific reason** must be offered based upon **facts** to support the asserted motivation--not generalizations. *Ecocolchem Inc. v. Southern California Edison, Co. supra*; *In re Rouffet*, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998).

In applying the above legal tenets to the exigencies of this case, Applicant submits that the requisite motivation element has **not** been established. Indeed, as previously pointed out, Narui et al. do **not** relate to a DOE. Accordingly, even **if** the applied references are combined as proposed by the Examiner, and that is a big **if** with which Applicant does not agree, the claimed invention would **not** result. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

Moreover, the Examiner has **not factually established** a reason to modify the monocrystalline zinc selenide material employed by Narui et al. by employing a polycrystalline zinc selenide material, much less with a reasonable expectation of successfully achieving the objectives

of Nauri et al. Specifically, on this record the **Examiner has never denied**, or offered any evidence inconsistent with the arguments advanced on page 12 of the responsive Amendment submitted May 7, 2003, that Narui et al. relate to a device which is fabricated with a **monocrystalline or single crystalline** ZnSe substrate. *In re Clinton*, 527 F.2d 1226, 188 USPQ 365 (CCPA 1976). It was also stressed in the paragraph bridging pages 12 and 13 of that responsive Amendments, that the difference between a **monocrystalline** substrate and a **polycrystalline** substrate is **functionally significant** in terms of **etching**. Having ducked that argument, the Examiner simply assumes that one having ordinary skill in the art would have proceeded **against** the teachings of Narui et al. by employing polycrystalline zinc selenide **because**, and **only because**, Biricik et al. employ polycrystalline zinc selenide in a completely **different** application. This amounts to nothing more than identifying wherein features of a claimed invention are perceived to reside in disparate references and announcing the obviousness conclusion. But that is **not legally sufficient** to establish obviousness. *In re Kotzab*, *supra*.; *Grain Processing Corp. v. American-Maize Products Co.*, *supra*. The requisite factual basis and reasoning does **not** exist. *In re Lee*, *supra*.

Indeed, Biricik et al. merely disclose that polycrystalline zinc selenide can be applied to **windows** for optical transmission, durability and availability in large sizes (column 15, lines 33 and 34, which is the portion cited by the Examiner). **Why** that would have led one having ordinary skill in the art to modify the particular device of Narui et al. is **not** explained. *In re Lee*, *supra*. Indeed, the reference to Biricik et al. is conspicuous by the **absence** of any description regarding any other application of polycrystalline zinc selenide. **Nor do Biricik et al. disclose any etching technique for polycrystalline grains.**

We are thus faced with a primary reference to Narui et al. which discloses a method of making a laser diode employing, as one of the materials for the laser diode, zinc selenide **single crystal** as a grating layer. As previously pointed out, this has **nothing to do** with a **DOE**.

The primary reference to Narui et al. also discloses an etching method which focuses upon precision in the transverse direction, which has **nothing to do** with the claimed invention, which focuses upon a smooth etched surface for diffracting an externally incident laser beam. The secondary reference to Biricik et al. merely discloses that polycrystalline zinc selenide can be used for **windows** for optical transmission, durability and availability in large sizes. **Biricik et al. neither disclose nor suggest any other application for polycrystalline zinc selenide, nor any method to etch polycrystalline zinc selenide.**

It is **not** apparent, and the Examiner has not explained **why** one having ordinary skill in the art would have been **realistically** led to substitute the polycrystalline zinc selenide window material disclosed by Biricik et al. for the **single crystalline** zinc selenide material employed by Narui et al. for **any reason**, much less with a **reasonable expectation of successfully achieving the objective of Narui et al. What is the factual basis for a reasonable expectation of success as judicially required?** *In re Vaeck, 947 F.2d 488, 20 USPQ2d 1434 (Fed. Cir. 1991).*

**There is no *prima facie* case.**

As previously pointed out, the secondary references to Collins, Harafuji and Kim et al. do not cure the above-argued deficiencies in the attempted combination of Narui et al. and Biricik et al. Applicant, therefore, submits that the Examiner has **failed** to establish a *prima facie* basis to deny patentability to any of the claims under 35 U.S.C. §103 for lack of the requisite **factual** basis and want of the requisite realistic **motivation**.

### **Indicium of Nonobviousness**

In the paragraph bridging pages 14 and 15 of the responsive Amendment submitted May 7, 2003, Applicant strenuously argued that the **problem** addressed and solved by a claimed invention must be given consideration in resolving the ultimate legal conclusion of obviousness under 35 U.S.C. §103. *North American Vaccine, Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 28 USPQ2d 1333 (Fed. Cir. 1993); *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 15 USPQ2d 1321 (Fed. Cir. 1990); *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989); *In re Nomiya*, 509 F.2d 566, 184 USPQ 607 (CCPA 1975). Applicant further stressed that the present invention addresses and solves an **etching problem involved in fabricating a DOE using conventional hydrocarbon-based gases**. Applicant **discovered** that the etching rate depends heavily on the crystal structure of the polycrystalline grains, because of the generation of by-products. This is disclosed at page 3 of the written description of the specification, lines 15 through 21. Since the etching speed of polycrystalline grains is normally different depending on the polycrystalline plane orientation, the etched surface becomes uneven or coarse. Because of the distance between the etched surface and the unetched plane, it is impossible to achieve the desired distance for diffraction within permissible deviation in order to fabricate an affective DOE.

Applicant addresses and solves that problem by etching the polycrystalline ZnSe substrate employing a chlorine-based gas which does not include a hydrocarbon group. **That problem is not even a blip on the radar screen of any of the applied references, who do not even relate to a DOE.** Indeed, the primary reference to Narui et al. do **not** disclose polycrystalline ZnSe. The secondary reference to Biricik et al. do **not** disclose any method of etching polycrystalline ZnSe. Under such circumstances, the problem addressed and solved by the claimed invention is a potent

indicium of **nonobviousness**. The Examiner has committed **legal error** in ignoring Applicant's arguments.

## Conclusion

As previously pointed out, the Examiner failed to establish a *prima facie* case of obviousness under 35 U.S.C. §103 for lack of the requisite factual basis and want of the requisite realistic motivation. Moreover, the Examiner has never denied that conventional practices for etching polycrystalline ZnSe involve the use of a hydrocarbon-based gas. Accordingly, **if**, and again that is a big **if** with which Applicant does not agree, one having ordinary skill in the art would somehow have proceeded **against** the teachings of Nauri et al., **ignored any expectation of success**, and **blindly** substituted a polycrystalline zinc selenide substrate for the monocrystalline zinc selenide substrate employed by Nauri et al., then one having ordinary skill in the art would have followed **conventional wisdom** by employing a **hydrocarbon-based gas**. On this issue the law is clear: one having ordinary skill in the art would must be presumed to follow conventional wisdom. *Ecocolchem Inc. v. Southern California Edison, Co., supra.; Standard Oil Co. v. American Cyanamid Co.*, 774 F.2d 448, 227 USPQ 293 (Fed. Cir. 1985). Again, the Examiner has never denied that conventional practices for etching polycrystalline zinc selenide involve the use of hydrocarbon-based gases. *In re Clinton, supra.* Accordingly, the Examiner has clearly failed to established a *prima facie* case of obviousness under 35 U.S.C. §103.

Moreover, upon giving due consideration to the potent indicium of **nonobviousness** stemming from the problem addressed and solved by the claimed invention, the conclusion appears inescapable that one having ordinary skill in the art would **not** have found the claimed invention **as**

**a whole** within the meaning of 35 U.S.C. §103. *Jones v. Hardy*, 727 F.2d 1524, 220 USPQ 1021 (Fed. Cir. 1984). Accordingly, each of the imposed rejections is factually and legally erroneous.

Applicant, therefore, submits that the imposed rejection of claims 1 and 4 under 35 U.S.C. §103 for obviousness predicated upon Narui et al. in view of Biricik et al., the imposed rejection of claims 2 and 7 under 35 U.S.C. §103 for obviousness predicated upon Narui et al. in view of Biricik et al., the imposed rejection of claims 3 and 8 under 35 U.S.C. §103 for obviousness predicated upon Narui et al. in view of Biricik et al. and Collins, the imposed rejection of claims 5, 9 and 10 under 35 U.S.C. §103 for obviousness predicated upon Narui et al. in view of Biricik et al. and Harafuji, and the imposed rejection of claims 6, 11 and 12 under 35 U.S.C. §103 for obviousness predicated upon Narui et al. in view of Biricik et al. and Kim et al. are not factually or legally viable and, hence, solicit withdrawal thereof.

### **New claim 13**

New claim 13 is free of the applied prior art by virtue of its dependence upon independent claim 1, the patentability of which has been argued. Moreover, Applicant separately argues the patentability of claim 13 based upon limitations expressed therein, which limitations are neither disclosed nor suggested by the applied prior art.

It should, therefore, be apparent that the imposed rejections have been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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